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THE MEDICAL MISSION OF THE FAA

HEARING BEFORE THE SUBCOMMITTEE ON TRANSPORTATION AVIATION AND MATERIALS OF THE COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY U.S. HOUSE OF REPRESENTATIVES ONE HUNDREDTH CONGRESS

SECOND SESSION

SEPTEMBER 14, 1988

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(III)

THE MEDICAL MISSION OF THE FAA

WEDNESDAY, SEPTEMBER 14, 1988

HOUSE OF REPRESENTATIVES,
COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY,
SUBCOMMITTEE ON TRANSPORTATION, AVIATION AND
MATERIALS,
Washington, D.C.

The subcommittee met, pursuant to notice, at 9:45 a.m., in Room 2318, Rayburn House Office Building, the Honorable Dave McCurdy [chairman of the subcommittee] presiding.

Mr. McCURDY. Good morning. The subcommittee will come to order.

I understand Mr. Lewis is on his way and will be here shortly, but in the interest of time, since we do have the Administrator here this morning, we want to proceed.

Today the Subcommittee on Transportation, Aviation and Materials will examine the medical mission of the FAA. This will involve a close look at the responsibilities of the Federal Air Surgeon and the Civil Aeromedical Institute, better known as CAMI. We will begin by looking at how FAA is preparing CAMI to carry out future research on human causes of aviation accidents.

Both a recent Office of Technology Assessment study on "Safe Skies for Tomorrow" and research bills originating with this subcommittee strongly recommend that FAA undertake a major initiative on human factors research. This subcommittee is of the opinion that CAMI should be at the very center of such an initiative.

We will also examine whether the Federal Air Surgeon, FAA's chief medical authority on aviation, commands the resources and organizational clout necessary to carry out a coordinated program of research, education, certification and consultation to improve air safety.

There has been some question as to whether he can give an unabridged medical opinion to the Administrator on matters such as safety regulations, training initiatives and systems development. It is disturbing to think that critical opinions on air safety would be buried deep in the organization, and we hope to clarify this matter.

With human error a factor in over 65 percent of commercial aviation accidents, I firmly believe that the Federal Air Surgeon and CAMI deserve to be heard and should be sought after for advice to ensure that pilots, air traffic controllers and mechanics perform their jobs without error.

I look forward to the testimony of Administrator McArtor, whom I know shares the subcommittee's view that human factors research should be broadened.

Mr. McArtor, you have been an excellent witness over the months, a very good administrator, and we appreciate your hard work and responsiveness to our requests.

We will also hear from expert witnesses on their recommendations for integrating aviation medical knowledge and research technology with decisions of the Agency.

With no further ado, Mr. Administrator, it is always a pleasure to have you back. I want to say at the outset that even though we started out, this subcommittee and the administration, with some differences over the future of CAMI and the role, I think we have come a long way and are making progress, and I appreciate your personal attention and involvement in this important issue, and also your willingness to go to Oklahoma City to inspect the facility itself and to tour it, and I am glad to see that you are continuing with that interest and involvement.

With that, sir, you may begin.

STATEMENT OF THE HONORABLE T. ALLAN McARTOR, ADMINISTRATOR, FEDERAL AVIATION ADMINISTRATION; ACCOMPANIED BY COLONEL ROBERT R. McMEEKIN, M.D., FEDERAL AIR SURGEON; WILLIAM COLLINS, PH.D., ASSISTANT MANAGER, CIVIL AEROMEDICAL INSTITUTE [CAMI], OKLAHOMA CITY, OKLAHOMA; AND JOHN TURNER, ASSOCIATE ADMINISTRATOR FOR ADVANCED DESIGN, FEDERAL AVIATION ADMINISTRATION

Mr. McARTOR. Thank you, Mr. Chairman. Thank you for your remarks, and thank you for your continued support. I would agree that much has happened this year to the positive with respect to our Civil Aeromedical Institute, and I thank you for your personal involvement as well. I welcome the opportunity to appear before you and your subcommittee today to describe the status of FAA activities at CAMI, our Civil Aeromedical Institute in Oklahoma City.

Last year the Associate Administrator, Tony Broderick, and Federal Air Surgeon, Bob McMeekin, appeared before this subcommittee to describe FAA efforts to revitalize CAMI. I had the opportunity in May to bring the subcommittee up to date on our efforts there. Since that time, we have continued our efforts at CAMI, and I am pleased to briefly highlight for you where we stand today.

Central to our efforts at CAMI is the appointment of a permanent manager with strong credentials and management skills to oversee the operation there on a day-to-day basis. You will recall that in May we were optimistic that we would be able to make a selection for that position in July. We have had to revise that goal since two of the candidates subsequently declined further interest in the position and the remaining candidates, in our view, did not fully meet the criteria we set out.

Consequently, we are re-announcing the position and have elevated the stature of the position by redesignating it as a deputy to the Federal Air Surgeon. This should help attract qualified candidates and also elevates the management level of the position within the agency hierarchy. As a further measure, recognizing that there is a need now for a permanent leadership presence at CAMI, we have created an assistant manager position there and

have selected Dr. Bill Collins, who is with me today, for that position.

We had earlier indicated to you that the FAA would take steps to assure that CAMI activities were better integrated into FAA regulatory and research activities, and we have done so. The Federal Air Surgeon has continued his close working relationship with CAMI. In addition, we have now established a process at headquarters through which our executive directors with regulatory and research responsibilities will meet on a periodic basis to review CAMI activities. CAMI will have a strong voice at headquarters, and those who oversee CAMI's activities will have access to my office.

We also said that we would take steps to improve our ties to academia and the private sector, and we have started that process. The first of a planned series of research projects was recently completed with the University of Oklahoma. That project examined the effects of a class of anti-hypertensive agents under simulated altitude conditions.

We are strengthening our relationships with the University of Oklahoma as well as other institutions. I cannot stress enough within the FAA the need to maintain close contact with the academic community. We have to if we are going to keep pace with new ideas and changing technology. To promote ties with professional societies and journals, we intend to hire a technical publication specialist to improve the quality and visibility of CAMI's research reporting.

We indicated that we would rebuild the toxicology lab at CAMI, and that is in process as well. Selection of a senior toxicologist is imminent. Following that selection, we can move forward to fill support staff vacancies. In the interim, we are continuing our relationship with the Armed Forces Institute of Pathology to develop toxicological analysis services. They will continue to provide us oversight and quality control in the future.

I instructed my staff to put together a management plan for CAMI to give me a road map of how to get where we need to go. They have put together a draft plan which outlines timetables and objectives. I will be pleased to share a copy of that plan with the subcommittee once we have finalized it. As an interim measure, my staff has recently briefed the chairman on some of our plans to strengthen CAMI.

In the past, most of CAMI's work has been related to human factors. We continue to see CAMI playing a central role in human factors, which is an area we need to accentuate within the FAA. This past year we have significantly stepped up our efforts to examine a variety of human factors issues associated with pilots and pilot training, but we need to do more to integrate human factors into all that we do. We cannot afford to concentrate on hardware alone.

As part of our efforts to more systematically address human factors in our research programs, I have asked our executive directors with regulatory and research responsibilities to put together an integrated human factors plan building on our current efforts and identifying additional needed efforts along with a delineation of organizational responsibility so we have clear lines of authority for the conduct of each project.

In closing, Mr. Chairman, I want to stress that I am committed to ensuring that CAMI is a first rate organization within the FAA. There is much valuable work to be done there, and we need to work within the agency, with the continued support of this subcommittee, to assure that we provide CAMI the people, equipment, sense of mission and management direction necessary for it to occupy a position of preeminence in the aviation community.

You have my assurance that we are taking those steps we believe necessary to achieve that objective.

I would once again like to thank you and members of the committee for taking time to join me at the Aeronautical Center and at CAMI. It meant a lot to the troops down there to have such focused attention by the leadership of the Congress, and I appreciate your taking that time.

I would be glad to answer any questions, along with my partners, Dr. Collins and Dr. McMeekin.

[The prepared statement of T. Allan McArtor follows:]

STATEMENT OF THE HONORABLE T. ALLAN MCARTOR, FEDERAL AVIATION ADMINISTRATION, BEFORE THE HOUSE COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY, SUBCOMMITTEE ON TRANSPORTATION, AVIATION, AND MATERIALS, CONCERNING THE FAA'S CIVIL AEROMEDICAL INSTITUTE. SEPTEMBER 14, 1988.

Mr. Chairman and Members of the Subcommittee:

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community. You have my assurance that we are taking those steps we believe necessary to achieve that objective.

That completes my prepared statement, Mr. Chairman. I would be pleased to respond to any questions you may have at this time.

Mr. McCURDY. Thank you, Mr. McArtor. Your statement is encouraging, and I've been pleased over the recent months to see some steps in the right direction. I have been concerned, as I think you had, with the length of time that it has taken to fill the position of the Manager.

As I understand it, by defining this as an Assistant Federal Air Surgeon or Assistant to the Air Surgeon—

Mr. McARTOR. The deputy.

Mr. McCURDY.—that you're perhaps changing the criteria. Perhaps you don't need a physician. The person doesn't have to be a physician in order to be the Manager of CAMI? Would you elaborate somewhat on that and whether you think that is outdated? Are there sufficient physicians within the organization itself? Are you looking primarily for a Manager? What is your vision of this new position?

Mr. McARTOR. If I first may also—just to go back to your preface. I'm frustrated, too, on the length of time that it has taken. On the other hand, when I came on board, we did not even have a Federal Air Surgeon.

Because of the close working relationship of the Federal Air Surgeon and CAMI, we wanted to get first Dr. McMeekin on board, who we are very fortunate to have, and then let him participate in the selection process for the CAMI Director. So, all of that has taken time, and perhaps illustrates how far we had to go this past year.

Yes, we feel that the leadership of CAMI, now that we are developing a good mission, we believe, for CAMI, that the skills involved in directing that are more management and vision skills—leadership skills—than necessarily medical skills. We've got strong medical representation down there. Dr. Bill Collins is a good example of that.

We have other medical people involved, and so we think that by changing our requirement to not require a medical degree for the leadership of CAMI, we may be able to fill that position more readily. By elevating it to a deputy position to the Federal Air Surgeon, we ensure its position of prominence within the organization.

Mr. McCURDY. Since the hearing that we held in Oklahoma City last year, December 7th, which is a significant date some people have had trouble with recently.

Mr. WALKER. That's Pearl Harbor Day, isn't it?

Mr. McCURDY. That's right, yes. It's been almost a year since we had that original hearing which, again, is a considerable length of time. Other than the arrangement trying to improve the relationship with the University and the academic community, can you point to any specific increases in funding or personnel slots of availability incoming? What specifics can you point to as action?

Mr. McARTOR. We began this year with a very deep concern about the future of CAMI, period. I think that's why your subcommittee and you personally, had some concern earlier in the year, last summer, as to what was the future of CAMI, because quite frankly, I wasn't sure what the future of CAMI was either. If it did not have a legitimate mission, there was not sense in keeping CAMI even alive.

It was a matter of, let's understand what value-added can we produce for the FAA and for the aviation community at this facility. It was a fine facility, but to be honest with you, it had been left adrift for some period of time. We really had to analyze where we would be going. We had a certain amount of brain drain there. We had some talented people leave and it was time to reassess the complete missions statement of CAMI.

We've done that. It took a little time to do it. In this past year, additional slots or additional personnel or additional money is going into CAMI. To me, that is really not the issue. The issue is, do we have the commitment that didn't exist a year ago to create CAMI. We do have that commitment and we do have monies not only devoted there, but en route there.

As a matter of fact, the first budget that I have had a real chance to put my hand in, is the fiscal year 1990 budget and we have three times the money devoted to human factors activities in that budget than we have had in the past. I firmly believe that if we are going to make sure that we are the value-added at CAMI, then we must maintain very close links to other institutions, to NASA, to Ames, to Lincoln labs, to the universities, to the medical communities themselves, to make sure we know what they are doing, and make our activities complementary and to manage those processes then, out at CAMI.

We've assessed our resources within the FAA. We have determined that CAMI is the proper focal point for these activities, and now, we're getting ready to gear up to provide the resources to that organization, and the personnel with which to pull it off.

Mr. McCURDY. Again, I applaud you for that direction, and the Chair has to be honest and candid from the standpoint that when I first looked at CAMI, I was not in a position to support increased funding for that facility, until they did delineate a clearer mission, and quite frankly, get their house in order. I think that has been the purpose of these hearings all along, and that has been the motivation by the Chair, and I think, the full Subcommittee.

On your integrated human factors plan that you're working on, I'm trying to see how we link CAMI's mission with that, and at what stage that is now, and what these time tables and objectives that you establish. How do they survive you, Mr. Administrator? I know you well, and I know that this is probably not a job that you're going to want to do for another eight or ten years.

Do your timetables or objectives, or does your mission plan have to receive approval from Secretary Burnley, or is that something that is going to be accomplished whenever you decide? Will it post-date you, is what I'm asking? Will this survive and go forward?

Mr. McARTOR. Yes, we are making sure that we have the organizational structure in place to institutionalize the prominence of CAMI, and then to institutionalize the mission and formalize all of that, and with FAA formal orders to that extent. The answer is yes, it will survive me and any other Administrator.

Our recent organizational change, having created executive directors, provides us a coordination and continuity link of similarly committed senior executives to make sure that CAMI and other initiatives that we have started this year, are institutionalized. I feel comfortable with that. I don't think that's a problem.

Mr. McCURDY. I want to ask one quick question before I yield to the distinguished gentleman from Florida. That's on the recent Delta crash at Dallas-Fort Worth. We are, I think, all thankful that there were as few casualties as there were. I think we have come a long way in safety, and certainly cabin safety.

However, the 14 individuals that were killed evidently, or according to our information, were killed as a result of the post-crash fire. Again, this is an area that CAMI has been involved in for a number of years. Have we learned anything from that crash that will influence the FAA's protection and survival research timetable on crash resistant fuel tanks, et cetera?

Mr. McARTOR. Well, I think, naturally after any of these accidents, a great deal of attention is drawn toward what are we doing and what has been the success rate of the work that we do. I must say that fuel additives have been proven to be sort of a futile effort. We simply have not made any progress in this country of having an adequate fuel additive to keep fuel which is used to turn a turbine from not burning.

We have, however, made great strides in other areas of flame retardants and fire protections, so we have instilled rules in the industry for fire extinguishing devices on our aircraft, the interiors of cargo holds, cabin materials within the cabins, fire block seats. We're confident that the fire block seats, as a matter of fact, significantly contributed to those people to be able to get out of the cabin.

When an airplane breaks apart though, and there is a fuel spill, it's very difficult to do anything to suppress that immediate fire. We had some self-styled experts recommend break-away fuel lines. We've looked at break-away fuel lines for a long, long time in civil aviation. What you don't want is to create a mechanism that may provide safety on the event of crash, but also creates more problems than it solves during normal operating procedures. Because of the flexing of fuel lines in flight with civil aviation, those lines that connect the fuel tank to the engine; we don't want them to fail in normal operations.

We have some aircraft that have break-away fitting between fuel tanks, and we have different fuel linings. When you have a wet wing, fuel in the wing, it's sometimes difficult to contain the fuel within the wing upon the event of crash. But we do have continuing activities in that regard. As you know, down there at CAMI, we're working and have developed the high G seat, passenger seat, and so there's a lot of activities focused on survivability of the unlikely event of aircraft crash and fire. These will continue, of course.

Mr. McCURDY. I said that was the last one, but I have one more before I yield. Because my friend, the gentleman from Florida is an engineer and you as an engineer and having taught engineering at the Air Force Academy, can appreciate the question coming from a lawyer. That is, that my concern is, that in the organizational chart, in the organization of the FAA, we have the Chief Counsel reporting to you, and we have an administrative assistant or Assistant Administrator for Civil Rights and for Government and Industry and Public Affairs, but we don't have the Office of Aviation Medicine or Federal Air Surgeon reporting directly to you.

Quite frankly, I think it's important that you receive that technical advice. If you can hear from your Chief Counsel or your civil rights lawyer, then perhaps you ought to be hearing from the Chief Medical Office, the chief technical person in that area, if truly we believe that human factors is such a critical area for air safety. Do you care to comment on that?

Mr. McARTOR. Yes, sir, I'd be glad to comment. I have been in several organizations at various levels—the top, the middle and the bottom. I have become, quite frankly, a student of organizational structure. I've never equated direct reporting with a sense of commitment or interest. I have people that report directly to me, quite frankly, that I see very seldom. I have people well within the organization, that because they represent an important part of what we are trying to do—for instance, our Office of General Aviation, we have very close contact with.

The idea is that the Administrator and the executive directors and the associate administrators, must become goal congruent, and if they are committed to the development of human factors activities and research and continuing efforts in support for CAMI, that commitment will be there, regardless of the direct reporting procedures.

You can't have everybody report directly to the Administrator, nor is it necessary to receive proper attention. The way I operate my office is that nobody has any trouble getting into the office to see me anyway, if it's an important issue. The Federal Air Surgeon is not at all prohibited from having direct contact with the Administrator.

But we've got to make sure that all of our leadership become goal congruent with respect to human factors, or it won't make any difference whether they report directly to me or not. So, that's why we want to have our research and development plan, our human factors integration plan, bought into by everybody, including the Congress, to make sure that they know what it is that we are doing; what our goals and objectives are; how we will measure ourselves against the achievement of those goals, and do we have the proper resources devoted against it.

That has to happen throughout the organization—not just a link between me and Dr. McMeekin.

Mr. McCURDY. I like that term "goal congruent." Is that an engineering term, Tom? We're goal congruent. We think that we're finally establishing that mission and that goal. I can assure you that this subcommittee and this member and others in the Congress are going to stay consistent supporters and certainly be very vigilant in watching the FAA, and ensuring that those goals are achieved and that they do come about.

The Gentleman from Florida.

Mr. LEWIS. Thank you, Mr. Chairman.

Thank you, Mr. McArtor. I want to congratulate you on moving forward with the human factors program. I think that the question the chairman asked is certainly specific and to the point. I think you are the best thing that ever happened to FAA, and I have said this publicly a number of times. I think you have great ideas and great plans and I would like to see them continue, but I know that someone of your talents is certainly not going to stay as the FAA

administrator for a lifetime. We all love jobs, but certain affairs change as life goes on.

I think that what I saw at CAMI I was well pleased. I know the first time I was out there at our hearing it was a rather distressful hearing, in a way, with the reduction of personnel, as you say, the brain drain. We lost that battle. I hope that we can see this come back.

When we look at the aircraft that are flying today and those that are on the planning boards, sometimes I even get a little bit nervous when I see we are talking about 747s, 757s, and 767s going to two pilots. Complexity in the cockpit is getting to a point that where are we going to draw the line that we say this individual or this series of individuals—and maybe Dr. Collins can answer this, I don't know—that you are capable of operating the cockpit of a 747 but that is as far as you go, that you are not just going to be able to cut it. Human endurance, human mind, human absorptions create these problems. How are we going to face those problems with the labor unions and the labor pools and things of this nature?

Mr. McARTOR. I am pleased to say that we are well under way, about a year into a very comprehensive study of pilot performance, competency and what it takes to certificate a pilot and to maintain currency. We are not satisfied at the FAA that the rules that have been on the books for 30 or 40 years are current and contemporary with today's operations. So we are trying to figure out what it is that makes a professional, competent pilot and how do we keep it that way, and then put those requirements in place, what kind of recurrent training is necessary.

We are also concerned with, which is traditional, the movement of pilots between cockpit positions as they move up the seniority ladder. But, when we have introduced fly-by-wire, electronic cockpit, glass cockpit systems, this causes us some concern as to the movement between those cockpits, then, and the last generation kind of aircraft cockpits. We are going to make sure that we understand that phenomenon very, very well, and if we need to have additional rules there, we will do so.

But this entire area of human performance or human factors, which is getting to be a bit of a buzzword and I want to make sure that it doesn't become such a camp term that we really lose track of how important it is, but in our aviation system, which is a combination, as I often said, of people, equipment and procedures, all of which are highly integrated, all of which need to back one another up, we need to fully understand what are the physiological limits of the human in the system and what are the psychological limits of the human in the system, and what are we expecting them to perform and can we expect consistency of performance.

Now, we have been focusing on the crew in the cockpit – cockpit resource management programs, how do we maintain vigilance, professionalism in the cockpit, things like that—but they are not the only people in our aviation system. We have got air traffic controllers that have the identical kinds of pressures on them and performance parameters and fatigue factors and routine and high technology systems management and everything else. We have mechanics in the system and we have technicians.

For the first time this year, as you recall after the Aloha accident when we held our international conference, we raised the issue of human factors on the maintenance flight line for the first time as to are we expecting too much of the mechanic to inspect hundreds of rivets, for instance, with precision, and have we armed him enough with technology and devices and training with which to conduct that inspection.

So we have a lot of work to do completely across the board of the humans in the system, how they integrate with our procedures, and then what equipment do we need to complement their activity and to back up their frailty. I am sure that we all recognize that perhaps, anyway, this last crash in Dallas, which seems to be a bit *deja vu* of the crash we had in Detroit, we still have a lot of work to do in this area.

So I think the FAA and the industry and academia and the medical community need to regroup on several of these fronts with respect to human performance, to understand both the limits and the capability of the people in the system.

Mr. LEWIS. Are your plans to take initial looks at— are you talking about the change in cockpit crews, moving up in seniority and also the changes from plane to plane type? Are you looking at when we become familiar with an aircraft, a checklist is a checklist but it is not a checklist? We go through switch off and such a thing. I have observed this a number of times just recently with airline pilots as they go through a checklist. In my judgment it is not a very good one. That guy may have flown that thing 1000 times in the last five years, but nonetheless you can forget that one area such as a flat switch and visual check and things like that.

How are we looking at these initial areas and trying to correct some of those?

Mr. McARTOR. That is a part of this cockpit resource management program. We have an advisory circular that is going out shortly. We have taken a real concerted effort to look at that and have brought the industry together to look at the CRM programs across the country. There are some really very good ones, and I have been out to see them personally myself. We are going to share the best parts of those programs with the entire industry.

But that is a part of the discipline in the cockpit. The precision and discipline and vigilance in the cockpit is the challenge/ response checklist. As a pilot, you well know that you can become so familiar with an environment that you do it by memory, but we are not willing to accept that in the aviation industry. We must have a challenge and we must have a response.

Even that breaks down, so we put warning horns and systems in place that, if you did forget, we are going to give you some other means to back that up. Sometimes those fail. In some of our newer cockpits in our fly-by-wire systems, unless the checklist is followed in order, it will not allow you to go to the next item, or it reads it out for you and it changes color on the CRT and things like that.

So we have more and more sophisticated ways, recognizing that when you are dealing with routine activities and several legs of a trip on a given day, you have to fly each one as if it were the first one of the day or the first one ever, and you have to maintain that discipline. It is a very difficult thing to do. We are not the only in-

dustry faced with that, but we certainly have such extraordinary safety obligations that we must solve that problem within our industry.

Mr. LEWIS. I might point out that in my flight to Oklahoma, I watched the Administrator run the checklist, and I was very much interested in that. So if the FAA Administrator can do it, so can anyone else who is flying an airplane.

I would like to ask when you think that your plan will be ready for submission. I think that in view of recent events, it is very important that we start moving in this, even to the extent of maybe a special task operation within FAA. I am not trying to tell you your business. What I am asking you is when do you think you will have your plan available? Is it going to take six months or a year? Are we going to have this thing within a few weeks or 90 days, or how are you working on this?

Mr. TURNER. We have a cockpit human factors plan that is in internal coordination starting next month. It should be out for user coordination later on this fall, talking a November time frame. That is one phase of our total human factors plan, the other portion being controller and some of the other pieces we are picking up and just starting to put together now. This main portion, the cockpit human factors plan, the Transportation Systems Center has been working with us on that over the past five months.

Mr. LEWIS. Could you identify yourself for the record, please?

Mr. TURNER. I'm sorry. John Turner, Associate Administrator for Advanced Design.

Mr. LEWIS. Thank you.

I would like to just go back again to the chairman's question on the recent Delta accident and the fuel systems. I just wonder sometimes. I applaud the test we had with the crashed aircraft and the misted fuel operation, and there were a lot of successes in that particular operation even though we had some problems and didn't prove what we really wanted to prove, I guess.

I am just wondering if you are going to allow a certain—and I'm asking you this directly—certain thoughts to become apparent within the research area at FAA that breakaway fuel lines, though they do have these problems and could cause leaks, could come loose in turbulence, could tear loose from an engine, is that any reason to stop the research and say it's too hard or we shouldn't look at that?

Mr. MCARTOR. No. I don't want to give the impression that anything is in the "too hard to do" jar. We need to continue to look at it. But what I don't want the public to think is that, "Gee, that is a great idea, why aren't we doing that, I understand it is being done in a military airplane or something like that." It is not that simple.

It is very difficult to design anything, as you well know, with five 9's or six 9's reliability, and if the occurrence of the catastrophe is even more remote than that, then you run into a trade-off of do you want to absorb failures within the system because of its own innate frailty that are more probable than the catastrophic event that you are trying to protect yourself against? The answer to that is no, we don't want fuel lines to disconnect during normal operations.

So we need to continue to look at a variety of things that can help suppress the fire at any crash scene if we are going to have fire, and you have to trade that off against cost-benefits, risks, and you have to continue to work on it all the time.

One of the reasons that you need continuing effort is the state of the art changes so rapidly, so that what was yesterday's too-hard-to-do or too expensive or not practical or didn't work, tomorrow may be a perfectly viable idea. So you have to be prepared to adopt to technological advance. That is why in the FAA we like to think of ourselves not so much in the research business.

The FAA is really not a pure research group as such. We do some of that, I think, at CAMI that we are probably truly the world's experts in, in some of these post-crash toxicology issues and things, but by and large private enterprise and academia do a good job at pure research. We are in the search and development business. We have to make sure that when ideas get developed in the pure research area, that we are prepared to implement those ideas in an aviation context. So we like to think of ourselves instead of being a research and development, being a search and development.

Mr. LEWIS. Who researched and designed the current two-minute fireblock areas for interiors?

Mr. McARTOR. Well, the fireblock seat development and the testing both occurred with industry and at CAMI, and at our Technical Center up at Atlantic City. We have a enormous—it's almost a hangar up there. We burn everything in there. We burn seats; we burn fuselages. We're looking at doing a lot of work with interior wall fires that are hard to get to—fires that might start, say, with electrical wiring in the fuselage wall between the interior and the exterior walls in an aircraft. We are able to do full scale testing with the plastics that are used in seats and overhead bins and things like that, and we're burning up seats, the fireblock seats.

We are absolutely confident that the fireblock seat feature of this aircraft that crashed in Dallas, helped those people get out—kept the fire out of that cabin for a minute or a minute and a half, and those people who were not injured upon impact, were able to actually, without a great deal of confusion, exit that airplane.

Mr. LEWIS. It is my understanding now that you have a rule out that it is a requirement that all aircraft out after 1990, have the new seat in it with the new wall.

Mr. McARTOR. All new aircraft have the new seat in it.

Mr. LEWIS. All new ones.

Mr. McARTOR. Yes, sir, the new aircraft will have the new cabin interior materials built into them. The fireblock seat rule has been out for some time, and you can think of it in terms of all ticket buying passengers on all airplanes in our system, are protected by the fireblock seat at this time.

Mr. LEWIS. How about the refurbished aircraft. In the rule, there's no real timeframe for these individuals to meet the requirement.

Mr. McARTOR. Well, cargo hold fires, of course, are of concern to us. Those materials are already out. Rules are in place for that. Then they have a retrofit feature where aircraft that are already

in the system, as they come in for retrofit, would have new materials added to them.

We don't have a rule, though, that says all airplanes must come back into dry dock and be reconfigured with their cabin interior materials. All airplanes did have to come back in and get the fireblock seat modification to it. Those have been done.

Mr. LEWIS. I had another question here and then I think I'm finished, Mr. Chairman. Mr. Chairman, my other questions, I believe, have to do with Atlantic City and I am going to go there. I would like to get the questions answered in writing. They don't have to do with CAMI, so, thank you Mr. McArtor. I appreciate your answers.

Mr. McCURDY. I thank the gentleman. The gentleman from Pennsylvania?

Mr. WALKER. Thank you, Mr. Chairman. At that December 7th hearing that was referred to earlier, the testimony was that there is not an effective FAA program to test pilots and crews for drugs and alcohol. It said that the current program is not working because there is not enough of a scientific basis for it. Can you tell me what the status of drug and alcohol testing is for pilots, mechanics and flight crews is at the moment?

Mr. McARTOR. Yes, sir. I'm a little confused by the statement. We have a rule making in process right now. The final rule actually is right on the threshold of being issued. It would require random drug tests for all safety related personnel within the aviation industry—pilots, mechanics and others in safety related positions. That would be administered by the carriers themselves.

The FAA, of course, will monitor that closely. CAMI will monitor the results closely and help to monitor the standards. But the testing is done by the private laboratories and private test facilities and is administered by the air carriers.

Mr. WALKER. Well, let me tell you why I'm making the statement that I am. We had a Dr. Carter from the Mayo Clinic here. He was asked by Mr. English about the drug testing program and Mr. English says, "You are saying then that you think the federal drug testing program should, in fact, be abandoned?" Dr. Carter says, "The current program, I do not think is working." Mr. English said, "For what reason?" Dr. Carter said, "There is just not enough scientific basis for it." Mr. English said, "For the testing?" Dr. Carter's reply was, "Testing, the followup, the statistics thereof and the design thereof."

In other words, the testimony that we had was that there is not a procedure that's ongoing, but questioned the scientific basis for the results and the statistics derived from those results. What I am really going to is, whether or not I guess you are satisfied that there is sufficient basis for judging the accuracy of the testing, and if not, whether or not FAA is taking any steps toward establishing a better testing program that would be scientifically sound?

Mr. McARTOR. Well, the standards are set by Health and Human Services as far as the testing standards themselves. We operate a random drug testing program at the FAA right now with our air traffic controllers, and have been for some time. We are most sensitive to the accuracy of testing. We find that the industry that does those tests, the laboratories, are getting better at it. We also find

that the percentages of false positives or false negatives still leave some room for improvement.

We've had one incidence of a false positive in our own testing program. We have, on the positive test side; our results show about a half of one percent positive tests among our air traffic controllers. That's a very small occurrence rate. Now, the students of statistics will say, well, that is so small then, that if you start running into a higher percentage of probability of false positives or false negatives, and therefore, your tests are invalid.

I personally believe that we need a random drug test program, not only in the FAA, but our industry, to give the public the assurance that we have a drug free transportation system, and that there is an adequate process in place to make sure that it remains drug free.

Mr. WALKER. Well, I agree with that. My concern is that the testing program has to be as scientifically sound as possible. The moment that we begin to have a series of incidents that call into question the testing program, the immediate thing that opponents will want to do, is abandon the whole testing program, rather than look at ways to correct it.

It seems to me that one of the things that we ought to be doing is doing the scientific work now that is necessary to assure that as we move forward, we have a sounder and sounder scientific basis for these tests, so that we do not have people calling the procedure into question, based upon the testing procedures.

Just one more question. Do you have any data on the rate of drug and alcohol abuse by pilots, flight crews and mechanics?

Mr. McARTOR. Not anything that you could draw any conclusions about an industry-wide occurrence rate. We had some samplings from time to time. We've had some theories. We've done post-accident testing and have found some occurrences, but you still can't draw much of a conclusion from that. I don't believe that we are comfortable that we have a database that really targets a specific problem in our industry.

Again, when you begin to justify then, why do you need a random drug test program, I would maintain that you either have a program to try to take some known problem and try to reduce the frequency of that problem, or you create a deterrent and a level of confidence. The latter, I believe, is what we have aimed at in our particular industry.

The Coast Guard in their random test program, took what was a ten percent problem, and drove it down to about a 1 percent or less than 1 percent problem. I don't believe that we're starting from there. I don't believe that we have that kind of frequency of occurrence. I think it will probably be similar to what we have in our air traffic controller ranks—well under one percent—probably a fraction of 1 percent; possibly even less than that.

That puts a lot of pressure on how management approaches these random drug test programs. You have to be sensitive to human dignity and human rights. You have to be absolutely committed to flawless testing and the procedures and processes of testing as you so well pointed out. You don't want your process to be the question. You want the product to be the question or be the advantage of the program.

To my knowledge, we don't have any industry data.

Mr. WALKER. Thank you, Mr. Chairman.

Mr. McCURDY. I thank the gentleman.

The gentleman from Florida.

Mr. LEWIS. Thank you, Mr. Chairman.

Also, I have an opening statement. I would like unanimous consent to include it in the record.

Mr. McCURDY. Without objection, it will be in the record.

Mr. LEWIS. Thank you, Mr. Chairman.

[The prepared opening statement of Tom Lewis follows:]

HON. TOM LEWIS (R-FL)
OPENING STATEMENT
HEARING ON MEDICAL MISSION OF FAA
SEPTEMBER 14, 1988

THANK YOU MR. CHAIRMAN.

THE IMPORTANCE OF A STRONG FEDERAL RESEARCH PROGRAM IN AVIATION MEDICINE AND RELATED ISSUES CANNOT BE OVER EMPHASIZED.

FOR EXAMPLE, THE RECENT AIRLINE CRASH IN DALLAS MAY HAVE INVOLVED HUMAN ERRORS. IN FACT, 65 PERCENT OF ALL AVIATION ACCIDENTS ARE DUE TO HUMAN ERROR. THE INESCAPABLE CONCLUSION IS THAT FAA SHOULD HAVE A STRONGER RESEARCH PROGRAM IN HUMAN FACTORS.

THIS WAS THE CONCLUSION REACHED BY THE OFFICE OF TECHNOLOGY ASSESSMENT IN THEIR JULY REPORT "SAFE SKIES FOR TOMORROW."

LEGISLATION THAT HAS PASSED THE COMMITTEE AND IS SCHEDULED FOR FLOOR ACTION NEXT WEEK ADDRESSES THIS ISSUE. H.R. 4686 INCLUDES PROVISIONS MANDATING LONG-RANGE RESEARCH IN HUMAN FACTORS AS WELL AS MAINTAINING AN MEDICINE INSTITUTE.

TODAY, I AM VERY ANXIOUS TO HEAR FROM THE WITNESSES ABOUT THE CURRENT AND FUTURE PLANS OF FAA AVIATION MEDICINE AND HUMAN FACTORS RESEARCH PROGRAMS.

MR. MCARTOR, WELCOME. I AM ALWAYS PLEASED TO HAVE YOUR TESTIFY BEFORE THE SUBCOMMITTEE.

THANK YOU MR. CHAIRMAN.

Mr. LEWIS. Mr. McArtor, I would like to ask you another question on your response about research. How deep and how generic does and is FAA going to get into any type of research? I gleaned from your answer that the FAA research is more superficial than in depth.

Mr. McARTOR. I hope you didn't hear that. What I was trying to say is that we, for instance, wouldn't be in a software research and development program or we wouldn't be involved in gallium arsenide semiconductors, and we certainly wouldn't be involved in the application of gallium arsenide to the aviation business. Our role is to translate pure research into applied research as it affects our particular mission, and that is a very much in depth activity.

We need to manage that process not only with the resources we have organic to our own organization but what is being done in academia and the different institutes and at Lincoln Labs and Ames and what is being done in the DOD as well. We have to be aware of what is going on and be able to manage that for our own process, and that is a very in depth activity.

We have just organized ourselves this year to focus on research and development efforts and activities. The FAA has not historically been an aggressive R&D kind of agency. We don't have a heritage of R&D like NASA does or the Defense Department. That which started off as R&D in the early phases of the NAS Plan went into program management and left a void of continued research.

So what we have done this year is we have gone back and organizationally restructured, as John Turner has pointed out, and he is in charge of that organization, our advance design and management control organization to recreate a formal structure where we can develop a research plan and prioritize that plan so that the Congress can buy into that plan with us and the industry can know where we are going to put our money, what we can expect to get from it, and proceed in that manner.

We have had some difficulty as well, though, in getting funding for research programs or to develop the justification for funding because not only has the FAA not historically been a research organization but the Department of Transportation has not either. So you have to know what research really means in order to devote resources against it, and you have to recognize that when you have a research program that "fails," that that is not a misspent dollar. I mean it is very valuable to know the things that don't work as well, and I think that takes a certain familiarity with research programs.

Mr. LEWIS. Thank you.

Dr. McMeekin, I have a question for you. How involved are you in the research program on human factors for the plan that we discussed earlier?

Dr. McMEEKIN. We are trying to be pretty much as involved as we can. Just a week ago I think Dr. Collins, for example, was up meeting with the international people at ICAO to discuss international aspects of the human factors program development, and we have met with Mr. Del Balzo and Mr. Melugin, the two executive directors principally involved in developing the guidelines for that plan to indicate that we very much want to be players in that area.

Mr. LEWIS. Are your plans also to work hand in glove with NASA in their human factors research to see how it would apply to your research program?

Dr. McMEEKIN. Yes, sir. I think the Administrator has already commented on the fact that the FAA wants to work not only with NASA and the Ames Laboratories but with academia and the universities as well.

Mr. LEWIS. Thank you, Mr. Chairman.

Mr. McCURDY. I thank the gentleman.

Since we have the opportunity to have Dr. Collins here and Dr. McMeekin, I wanted to ask a question if I could, Mr. Administrator.

Last July, for instance, you wrote in response to Congressman Sabo concerning handicapped persons and their ability to operate the unlocking mechanisms on the airline cabin doors. In the letter you mentioned that FAA is considering a rulemaking on exit row seating. Will the Federal Air Surgeon and CAMI be involved in the rulemaking process and related research investigations?

Another example would be an area such as the advanced automation system where we are designing to help the air traffic controller to be more productive, but this is going to bring about, I think, undoubtedly new human performance questions. Will CAMI researchers be able to work with the winning AAS contractor to spot human performance problems during the system development, and what role will CAMI have in controller training on that at the Academy?

I wanted to see if those gentlemen had ideas or suggestions in that area.

Mr. McARTOR. Could I take a shot at it first?

Mr. McCURDY. Sure.

Mr. McARTOR. A lot of the human factors activity that was precedent to the advanced automation system design competition phase and contract, a lot of that was done at the Tech Center in Atlantic City on the form, fit and function work, and we certainly don't want to discontinue activities at the Tech Center, but I think it is also appropriate to involve CAMI now with our reconstituted CAMI more and more in those activities.

I think there is a great deal of expertise and facility that can be utilized there, and then coincidentally it is co-located where the training headquarters will be as well. So there is a lot of work that can be done and intended to be done in the form, fit, function human factors side of the air traffic controller.

We are doing some work there at CAMI right now in understanding controller interpretation of information on screens and what some of the limits are to controller activity. I think that will increase as well.

Mr. McCURDY. I am trying to tie down some specific examples of areas that they see in the future and some of the diversity in the type of research that you think might be accomplished there. That is why I wanted to bring both of those gentlemen in.

Mr. McARTOR. There is a screen clutter program that is going on right now at CAMI of the controller being able to understand the information that is presented to him on the screen, which is most

important to us because we have a new display technology now that we are going to be developing with multicolored displays.

Bill, do you have anything to add to that?

Mr. COLLINS. I think, in support of what Mr. McArtor has been saying, we have had a program that has been looking into advanced automation with respect to the air traffic controllers, a small research program that has been continuing, and it is the one he mentioned. The current work has to do with clutter and the ability to identify a VFR aircraft amidst clutter, whether a flashing signal or a color signal or some combination of events that would make such an observation more likely or shorten the time to detect, increase the likelihood of detection.

We have been intimately involved with the development, in terms of the new training programs that Mr. McArtor is instituting, in the development of what will be occurring at the Academy. As you know, we have a very good relationship with the Academy. We have been intimately involved. By that I mean we have had people participating in the proceedings for field training for air traffic controllers, with more advanced automation.

We are represented from the Office of Aviation Medicine on the Review Board that Mr. Turner spoke about, so over the past few months we have gotten incorporated into a lot of the activities that are going on that are going to change significantly the way controllers are selected and trained and the way human factors research is done in the Agency.

Mr. McCURDY. You led into my question and I think that is good from the standpoint of my concern is how you take that body of knowledge that you are accumulating and disseminate it or plug it in to the right place. That is why I keep coming back to the organizational charts. I understand organizational charts don't mean anything and it's the people that are situated in those boxes that make the difference, but at the same time you have to have that relationship and that ability to get your information from the left hand to the right hand or from A to Z.

I picked up or detected that you say you are more involved now than you have been. Do you feel there are areas that you could be more involved? Are there areas you want to carve out more in the Advanced Automation System? Those kinds of areas.

Mr. McARTOR. I am a firm believer in involving everybody to the maximum extent that they can contribute, and I think in fairness that we need to reestablish some capability so that we can involve CAMI more in the future. As you know, we are going through a complete restructuring of our training techniques and training syllabus and course of instruction for air traffic controllers. We will be doing the same thing for our technicians and all technical training that we do within the FAA.

We have for the first time a director of higher education and training at the FAA. When those techniques of training are developed, it is a team process so that air traffic control is involved in it. We are trying to determine what skills need to be learned, and then we try to learn what is the best way to impart those skills or make those skills stick, and then what kind of training do you need to have recurrent to make sure that those skills have not left the person.

That team includes now CAMI as one of the participating members, so whatever knowledge they have with respect to the psychological or physiological limits or the best way for training processes to occur will be able to be surfaced as that team meets to discuss these things. So we consider them to be a full player, but by the same token, we need to give some more ammunition to them so they can be a truly productive player.

Mr. McCURDY. Again, that is goal congruence, and we share that, and certainly I want to congratulate Dr. Collins on his appointment as assistant manager. I am somewhat concerned by the fact we have not filled that position of manager yet, but in the meantime, I assume that the assistant manager has full force and authority to speak on behalf of the Agency and can implement those goals and objectives and will be operating as the acting manager. Is that correct?

Mr. MCARTOR. Absolutely. We have a great deal of confidence in Bill Collins, and we are very pleased that he will be filling this role. It will also, of course, demand very close personal attention, as it does from Dr. Bob McMeekin.

Mr. McCURDY. We are here to help rebuild CAMI, and I think that is our goal, but more importantly the goal is to improve our capabilities within the FAA and all air medical research and consultation, and I think I am pleased that we are moving in that direction. I am not always the most patient chairman, but I think we are at least defining goals. Quite frankly, compared to the Department of Defense sometimes, I would say we are making light years of changes compared to some over there.

Are there any further questions of the Administrator?

Mr. McCURDY. Dr. McMeekin, as the former director the Armed Services Institute of Pathology, you are familiar with their corporate arm known as the Registry. What is the purpose of the Registry and could CAMI benefit from such an idea. Dr. Schafer, I believe, in his testimony, supports that concept.

Dr. McMEEKIN. The American Registry of the Pathology is the corporate arm I think you are referring to, which is a non-profit corporate entity chartered by Congress to facilitate the interaction of a government organization such as the Armed Forces Institute, with civilian medical institutions, universities, and professional associations.

That's not, in fact, the only organization like that. The second one that I am aware of is the Jackson Foundation at the Uniformed Services University of the Health Sciences, the military medical school. Their charter allows them to engage in cooperative, collaborative endeavors in consultation education research, and to facilitate the cooperation and to serve as a focus for the dissemination of the educational materials developed.

Mr. McCURDY. My question was, could CAMI benefit from such an idea?

Dr. McMEEKIN. I believe that it would, yes.

Mr. McCURDY. Would legislation be required? You said that that was congressionally chartered.

Dr. McMEEKIN. That's correct, yes.

Mr. McCURDY. You don't appear enthusiastic about that suggestion. Is that a lukewarm yes, or is it a good idea, a bad idea? You

know, he's going to follow you in a few minutes, so he is going to have the last shot, but Dr. Schafer thought that that was a good idea. Do you second that suggestion?

Dr. McMEEKIN. Well, as you know, I'm looking for ways to facilitate our collaboration with universities and academia, and this is a very good way of doing it. It's been very productive for the Armed Forces Institute of Pathology and for the medical school.

Mr. McCURDY. Very good. Well, gentlemen, thank you. Allan, is always a pleasure and I echo the comments of the gentleman from Florida. First of all, it is a pleasure to fly with you. I don't mind flying with you, as long as we're not doing the stunts. We'll do that in a real airplane sometime.

Also, from the standpoint that you are a breath of fresh air in this large federal bureaucracy up here. As long as we have goal congruence, then I think we are going to have a very positive relationship. It has been very good up to this point, and I appreciate what you are doing. Best of luck to your sons at the Academy, and just hope they don't play O. U., right?

With that, we will move to our next witnesses. Dr. George Schafer, and Dr. Stanley Mohler. Dr. Schafer, the Clinical Director of PHP Healthcare Corporation in Alexandria, Virginia, and Former Surgeon General of the United States Air Force will go first. Then we will hear from Dr. Stanley, Mohler, Director of Aerospace Medicine, Department of Community Medicine, Wright State University School of Medicine, Dayton Ohio, who is a former manager of CAMI.

Gentlemen, welcome. We certainly appreciate your taking time to appear before us today, and we've read your testimony and it is admitted into the record in its entirety. You can summarize or proceed as you wish. We look forward to hearing your testimony.

STATEMENT OF GEORGE E. SCHAFER, M.D., VICE PRESIDENT AND MEDICAL DIRECTOR, PHP HEALTHCARE CORPORATION; STANLEY R. MOHLER, M.D., M.A., DIRECTOR OF AEROSPACE MEDICINE, DEPARTMENT OF COMMUNITY MEDICINE, WRIGHT STATE UNIVERSITY SCHOOL OF MEDICINE.

Dr. SCHAFER. All right, sir. Thank you very much, Mr. Chairman. It is indeed a pleasure for me, and an honor to participate in the activities of this subcommittee as it concerns the medical mission of the FAA. I apologize for using the term "I," so much, but I think it might help me be demonstrative of the point I'm trying to make. This has to do with the career that I had in the United States Air Force—31 years in which I had, indeed, the privilege and the pleasure of operating at almost every command level within the structure of the Air Force—for example, Squadron Group, Wing, Division, Command to the Air Staff. In all of these levels, I had the opportunity of working with those people that were next to the Senior Commander. In other words, I was next to the Senior Commander also. This facilitated my ability to communicate with the Commander and with his key staff element, those things of medical nature that were important to the mission and the roles of that particular organization that I was in.

I could communicate directly to the Commander. I could tell him about the health of the Command. I could tell him about those things that had to do with safety, but more important, I had the authority and the direct line those people who were his key advisors in those areas. That's what I really want to impress with the facility with in which I was able to work. For example, I could go to the personnel people and deal directly with them on an equivalent level.

There were most certainly personnel matters that got intertwined with medical matters and were of great significance. Let me drop that point of attack for just a second, and go into what I've thought has always been the strength of American medicine. That's the triumvirate of research, education, and medical practice. It's those three parts that have made American Medicine strong, and I think also that facilitated the practice of aviation medicine within the United States Air Force, very strong.

Now, there are those people that are organizational purists, that will tell you that you must put education under training organizations. You must put research under research organizations, and you should put medicine under personnel, for after all, it deals with people.

That's purest point of view, and it surely and most certainly doesn't work and hasn't been workable, I don't think, in those organizations that that has been done in past years. Such arrangements, however, are easier for an accounting, for measuring, for standardizing those things that seem to be peculiar characteristics of bureaucracy. They don't necessarily make for communication between research, education and practice that is so necessary for medical endeavors.

I was glad to see that this concept of sort of a tripartite concept, is being considered for CAMI in its efforts in the education area, in the research area and the practice of aviation medicine area. The organizational alignment is one other area that I feel rather strongly about, and I'm sure that there are differences of opinion in this regard, and, that's the alignment of the Federal Air Surgeon with or within the staff of the Administrator.

Let me emphasize one point again. It's not so that this person can report directly to the Administrator. It as much that he has at an equivalent level, the authority to deal with and to do business with personnel, with operations with safety, with regulatory agencies and the like. That's where it becomes very important.

In other words, he cuts across. Most certainly, the Federal Air Surgeon is much more important than developing physical standards for flight crews and air traffic controllers. He cuts into the areas of research, the areas of toxicology that's been mentioned before. He cuts into those areas of human factors. He is, in fact, responsible, as I understand it, for not only the certification of air crews, but for the training and the continuing medical education of aviation medical examiners around the country.

So, he has those responsibilities and that hits into all of the different staff activities. To be able to interface with these across the board is a significant thing. It's not him being able to get right next to the Administrator as much as to deal with those people who do get next to the Administrator in a direct way.

Well let me conclude with just a few comments about CAMI and that has do with this corporate arm. There are different mechanisms for doing something like a corporate arm, but having an organization that is a private foundation, would give them the flexibility that they perhaps need to focus on different areas of research or in different areas of education from time to time, as circumstances with the country would call for it.

I think the flexibility that's necessary for that can only come from a corporate arm, and that would be a good way to go. I'm not sure that you can't devise other schemes for a corporate arm or something like a corporate arm, that does not have to be mandated by a congressional law. Mr. Chairman, thank you very much for the opportunity to make these comments and participate in some small way.

[The prepared statement of George E. Schafer, M.D. follows:]

STATEMENT OF GEORGE E. SCHAFER, M.D., VICE PRESIDENT AND MEDICAL DIRECTOR, PHP HEALTHCARE CORPORATION, AND FORMER SURGEON GENERAL OF THE UNITED STATES AIR FORCE, BEFORE THE HOUSE COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY, SUBCOMMITTEE ON TRANSPORTATION, AVIATION AND MATERIALS, CONCERNING THE MEDICAL MISSION OF THE FEDERAL AVIATION ADMINISTRATION.

Mr. Chairman and Members of the Subcommittee:

I am Dr. George E. Schafer, medical director of PHP Healthcare Corporation, a medical service company. I served in the United States Air Force for 31 years and retired in the grade of Lieutenant General.

It is a pleasure and honor for me to participate in this hearing on the medical mission of the Federal Aviation Administration.

My career in the USAF spanned all levels of activity from Squadron, Group, Wing, Division, Command to Air Staff. In each of these activities it was incumbent on me to understand the roles and missions of the line organization to which I was assigned. Fortunately, I functioned at the highest level of operation in each organization. This facilitated my ability to reach into all facets and apply the principles and practice of aviation medicine. I could communicate with and report to the senior commander those medical matters of importance to the mission.

I consider myself most fortunate to have always been under the senior leader of the organizational entity to which I was assigned and to be a part of the operational elements of the USAF. This organizational structure of the USAF, I believe, enabled me to communicate matters of medical standards, health of command, research developments, and other matters that could impact operations and do so in a timely way to effect decisions of relevance to the common goals of the organization. I was able to emphasize the resources necessary, to compete with others for oft times scarce resources and to insure appropriate action based on the authority of the organizational entity to which I was assigned.

I have always been impressed by the need for the practice of aviation medicine to be linked closely with education and research. It is this triumvirate that has made American medicine the best in the world and has enabled the USAF to maintain a medical service second to none. It has not always been easy to maintain. There are organizational purists who insist that education be assigned to training organizations, that research be assigned to research organizations and that medical entities be assigned to personnel functions since after all medicine deals with people. It is easier for accounting, measuring, and comparing--a proclivity of bureaucracies; but, for the success of the support mission of Aviation Medicine, there must be a close communication between the elements of the triumvirate to enable the appropriate impact on each other. I am pleased to see that the current thinking within the FAA incorporates this concept for the Civil Aeromedical Institute.

The health of the institute and the proper interaction of Aviation Medicine within the Federal Aviation Administration suggests that another step be seriously considered. That is the organizational alignment of Aviation Medicine.

To be sure, one of the responsibilities of the Federal Air Surgeon is to develop, refine, and insure that physical standards of flight crews and aircraft controllers are met at all times. This, however, is not the only charge of the Federal Air Surgeon. He has the responsibility to insure proper certification of aircrew and controllers. He must strive to insure that workplace layouts take maximum advantage of human characteristics for maximum efficiency. He must foster research in the areas of toxicology and aircraft safety. He must provide training for aircrew in the physiological effects of flying. He must insure that continuing education of aviation medical examiners.

Although this is far from a complete listing of functions, it does help to demonstrate that the Federal Air Surgeon is charged with many responsibilities that cut across the entire organizational structure of the Federal Aviation Administration. He should not, therefore, be limited by an organizational entity that has only one facet of the total responsibility of the FAA. If the Federal Air Surgeon is to communicate and interact in many areas he should be located in such a way that he is neither inhibited nor stifled in his endeavors. This was the key to success of those operations that I was responsible for in the USAF at the various levels that I have already cited.

It is my belief that the Federal Air Surgeon should be a member of the staff of the Administrator. he should be a key staff element at the same level as those entities that are responsible for Aviation Safety, General Counsel, Operations, Regulation and Compliance, and System Development. The Federal Air Surgeon should contribute to these elements. He, in fact, has responsibilities that cut into these areas that require direct and close communication and working relationships.

Allow me to conclude with one item as it concerns the Civil Aeromedical Institute (CAMI). It is my understanding that there have been discussions concerning the establishment of a corporate arm for the CAMI. Should such an entity come to fruition, a flexibility can be achieved that will enhance not only the research mission of CAMI but also those elements of education and clinical medicine so intertwined with the aviation community.

Mr. Chairman, thank you for providing me this opportunity to participate in your deliberations.

BIOGRAPHICAL SKETCH

Dr. George E. Schafer is Vice President and Medical Director of PHP Healthcare Corporation, a national health care service company, with corporate headquarters in Alexandria, Virginia. He is a graduate of the College of Medicine of the University of Cincinnati.

Dr. Schafer was called to active duty and served 31 years in the United States Air Force. He served as a flight surgeon and in hospitals both in the United States and overseas. After serving in the capacity of hospital commander, he then progressed through a series of increasingly responsible medical management positions. In addition, during his career in the Air Force he was involved in research and development in the USAF Biotechnology program. He became Commander of the USAF School of Aerospace Medicine as well as Commander of the Aerospace Medical Division, an organization consisting of the Air Force's Research and Development Laboratories, School of Aerospace Medicine and the Wilford Hall USAF Medical Center.

Dr. Schafer culminated his Air Force career as Surgeon General, 1975-1978, and retired in the grade of Lieutenant General. In this capacity his responsibilities were worldwide with responsibility for all Air Force medical activities, both domestic and foreign.

Dr. Schafer is certified by the American Board of Preventive Medicine in the specialty of Aerospace Medicine. He is past president of the Aerospace Medical Association, the Association of Military Surgeons of the United States and the Society of Air Force Flight Surgeons. Dr. Schafer is a member of the AMA and is an elected Fellow in the Aerospace Medical Association. He is also the recipient of numerous awards and decorations.

Mr. McCURDY. Thank you, Dr. Schafer.

We will hear from Dr. Mohler and then we will have some questions.

Dr. MOHLER. Chairman McCurdy, Mr. Lewis and others, I appreciate the opportunity to come and cover this important topic because it is one that has been near and dear to my heart for many years.

I might begin by noting that I was a happy physician working in the Center for Aging Research at the National Institutes of Health in the 1950s, and I was approached by the early beginners in the FAA from the standpoint that they had some major problems facing them and they were starting a new institute, and would I be interested in being its director.

At that time the Institute leader, so to speak, was titled "Director" and had some real clout. I reported to Washington, D.C. to the Federal Air Surgeon's Office, and the Federal Air Surgeon at that time reported to the Administrator. So if I had any major problems getting something approved or through the processes, I could call the Federal Air Surgeon and he could go in and see the Administrator or deal with it across the board with the other equal office heads.

That is how we operated for approximately five years. When I got there there were 24 people in the research part of the Institute. That grew to 135. I am speaking purely of the research part. The Institute started as the Civil Aeromedical Research Institute. In Norman, Oklahoma at Westheimer Field in the initial temporary facilities, we started with approximately 24 people. These included a number of scientists and support persons.

I moved in on Sherry Avenue, which is near Main Street, not far from Westheimer Field. We had no trouble recruiting top talent. It is a beautiful place to live. It is a beautiful aeronautical center. The whole area is exactly perfect for recruiting top notch talent who want to do research on aviation medicine, safety and human factors problems.

We grew to approximately 135 in 1965, and we began to need a stronger voice in Washington. I can tell you that within the FAA we might have goal congruence, but priority in resource congruence within that setting, achieving that is another matter. As a matter of fact, sometimes during those years it was like a Washington Redskins/Dallas Cowboys game within the FAA, with flight standards, air traffic personnel fighting for the limited, finite resources.

The Federal Air Surgeon had clout, was at that level and could hold his own within that arena. Then in approximately the early 1980s, I had by that time transferred to Washington, and it was decided that the Office of Aviation Medicine should be submerged under another area of Standards. I in the meantime had been offered this position as professor, director of aerospace medicine and vice chairman of the department of community medicine at Wright State University. This was too good to pass, so I transitioned over there.

Much to my shock, the Federal Air Surgeon's Office was actually moved down in the organization. I understand that not too long ago it was even moved further down. This, in my view, connotes serious

problems. The intentions are good. It is well to see, in my view, the progress made in recognizing the importance of aeromedical research in human factors, but if the Federal Air Surgeon loses the clout to deal with these problems within the organization, we will see a continuing loss of resources and personnel.

In conclusion, I would like to note that I have been in constant interaction with the FAA since I left. I have had FAA contracts. I have had consultantships at various places in the FAA. I have testified for the FAA in court cases of pilots who have flown while under the influence of alcohol, I have lectured for the FAA. I attend their advanced seminars.

I am very distressed to see as recently as last April that with the Civil Aeromedical Institute there is a steady incursion of non-medical people. I am speaking of office staff, clerical personnel and non-medical officers moving into these beautifully designed, tailor-made physiologic and other laboratories. They are tearing out research equipment, sinks, in-place hardware, putting in non-medical people who really should much better be placed in other parts of the Aeronautical Center in real offices. This is impairing the medical research program.

So in addition to recommending that the Federal Air Surgeon report to the Administrator, I recommend they remove all those people out of there and put them in appropriate offices elsewhere.

Lastly, I give my whole-hearted support to both H.R. 3779 and H.R. 4686. These, I think, would do a great deal toward moving ahead the FAA recognition and support of the Civil Aeromedical Institute and the Aviation Medicine Office.

Thank you very much.

[The prepared statement of Dr. Mohler follows:]

September 12, 1988

Testimony: Congressional Hearing on
FAA Aeromedical Research, Subcommittee on
Transportation, Aviation, and Materials
U.S. House of Representatives
Washington, D.C.
September 14, 1988

Stanley R. Mohler, M.D.
Wright State University School of Medicine
Dayton, Ohio

Mr. Chairman, I am Stanley R. Mohler, M.D., Professor and Vice Chairman and Director of Aerospace Medicine, Department of Community Medicine, Wright State University School of Medicine, Dayton, Ohio. I was Director of the FAA Civil Aeromedical Research Institute, now the Civil Aeromedical Institute from August 1961 to November 1965, when I transferred to FAA Headquarters as Chief of the Aeromedical Application Division. I moved to Dayton, Ohio in the summer of 1978 when I assumed my present position. Prior to joining the FAA, I was a commissioned medical officer for five years in the U.S. Public Health Service, four of these as Medical Officer in the Center for Aging Research of the National Institutes of Health Bethesda, Maryland. My NIH experience in the field of aging was a significant factor in my recruitment by the FAA as Director of their new Civil Aeromedical Research Institute.

When I first arrived at the new Institute, I found a nucleus group of scientists and support staff (approximately 24), located in temporary facilities at Westheimer Field, Norman, Oklahoma. The group was filled with enthusiasm, drive and ability, and was involved in a number of new studies having high significance to aviation progress and safety. All that the group needed was leadership and support, together with a certain degree of guidance along the lines of the highly productive NIH research programs. My every effort was directed at providing these requirements.

Each Branch Chief in the Institute, along with the onboard institute scientists, provided the designs, custom made, for the laboratory space within the new planned Civil Aeromedical Research Institute building that was to go into position at the Aeronautical Center, Will Rogers Airport, Oklahoma City. This unique opportunity for first-rate scientists to custom-tailor their own laboratory space has occurred only very rarely anywhere in the world. CAMI represents one of these rare instances in medical science.

By the fall of 1962, the scientists had moved into their new Institute building, and the original number of scientists and staff grew by recruitment to approximately 135, including the part-time, contract, and "without compensation" personnel (these latter included graduate students at the University of

Oklahoma who worked on certain research projects that applied to their thesis research). The Institute became a thriving, creative, productive and contributory activity to aviation safety, recognized throughout the world as the leader in productive civil aviation medicine research. The U.S. aviation industry and that of many other countries began to draw heavily on the new scientific research data and expertise at the Institute.

I won't dwell on the many contributions to air safety that the Civil Aeromedical Institute has made and is continuing to make. These have been documented in previous Hearings. However, many people are unaware that the passenger emergency decompression oxygen system in modern airliners was developed and patented initially by Mr. John Swearingen of the Civil Aeromedical Research Laboratory which became the Civil Aeromedical Research Institute in 1960. It is also not well appreciated that a substantial number of the emergency escape procedures including emergency lighting and emergency escape slides and rafts are directly evolved from Civil Aeromedical Institute studies and evaluations, utilizing the Institute's unique emergency evacuation and ditching pool facilities. The Institute developed shoulder harness and de-lethalized cockpit design features which, when the National Highway Transportation Safety Administration (NHTSA) was created, served as the primary survival data for justifying automobile shoulder harness and

seat belt restraint systems and "delethalized" instrument panels. The basic data was obtained from Mr. John Swearingen by Dr. William Haddon, Head of the NHTSA at that time. Millions of lives were saved by the Civil Aeromedical Institute Research data both in ground transportation and in air transportation (see FAA report FAA-AM-71-3).

A further area of medical contribution that also is little known derives from the work of Dr. Bruno Balke at the Institute. Dr. Balke developed the "Balke Protocol" in the early 1960's which is a specific stress test of cardiovascular health and general fitness. The Balke Protocol is used widely throughout the world in the area of sports medicine and clinical programs that evaluate cardiovascular functions. Dr. Balke accomplished these studies at the CAMI building in the specially constructed gymnasium that had observation and fully equipped laboratories for data collection. He also studied the rehabilitation of persons who have had heart attacks (myocardial infarction), and his work formed much of the basis for returning hundreds of pilots safely to flight status as well as restoring large numbers of others to a healthy life.

I am sorry to observe that the FAA is utilizing the above referenced laboratory-gymnasium as a general space area accommodating non-medical personnel from other parts of the FAA. Today, this beautiful laboratory space with its especially designed custom-made gymnasium floor is trampled

upon by clerical personnel who have no bearing upon the medical research program. I am also saddened to see the custom-made physiologocal laboratories in other parts of the Civil Aeromedical Research Institute being converted to non-medical clerical personnel use, a tremendous waste of the special technical, medical laboratory research space, not to mention the waste of tax resources by housing non-medical, non-technical, clerical and administrative personnel in custom-tailored laboratory facilities which cannot be utilized for the aeromedical and human factors air safety purposes for which they were designed. Other examples within the Civil Aeromedical Institute that are bit by bit being "whittled away" could be given, wherein this unique and valuable resource is becoming greatly weakened and deflected from its primary mission accomplishment. Such loss of space hampers the FAA, for example, in its search for a solution to present airline pilot fatigue problems, highlighted in the current Aviation Safety Reporting System of NASA and by the NTSB. The lost space noted above should be the FAA central location for physiologic and human factors pilot fatigue studies, including those problems related to scheduling.

Why has the FAA progressively diminished its aviation medicine research program, so widely recognized and utilized as a highly contributory safety entity? I believe I know the answer to this question, based upon my 17 years in the FAA in major

medical positions in the field and in FAA headquarters. The answer is really quite simple and it comes down to the co-existence within the FAA of two philosophies. One of these is (1) that the FAA should be a leader in air safety and progress, actively promoting air safety, actively seeking to incorporate new technological advances in civil aviation, and steadily pushing for positive results in diminishing the accident rate. The other philosophy, observed among quite a number of those in the FAA, is that (2) the FAA is basically a political, paper-shuffling, entity, whose primary duties are to merely administer and enforce the existing written aviation regulations. They believe that the FAA is not responsible for bringing about technological advances, and that the FAA must keep the various groups its regulates mollified, even if this means, as a concrete example,

not requiring now the available upgraded interior materials for airline aircraft, materials that are less toxic during onboard fires than are the currently used materials.

Who is going to accomplish make available to all, significant civil aeromedical safety and human factors research data if not the Civil Aeromedical Institute? The airlines are not. They are struggling to stay in business and return a profit to their investors. The aircraft manufacturers are not. They are building specific aircraft to the existing Federal aviation regulations, and they are trying to do this on tight time

schedules and budgets, while making a profit for their shareholders. The research they do accomplish is often proprietary, delaying its widespread application by competitors. Other Government agencies have their specific objectives, priorities and responsibilities, and attempt not to intrude upon FAA responsibilities other than by specific agreement. Some Government agencies, academic programs and private research groups accomplish scattered pieces of the FAA's aeromedical research requirements, but this approach is essentially piecemeal, and often requires lengthy, time-consuming, contract procedures.

We arrive, thus, at the only reasonable conclusion: The FAA must conduct its own capable, competent, and suitably supported in-house aeromedical and human factors program if it is to accomplish its aviation safety mission. At the Civil Aeromedical Institute the FAA has currently in place the facility and a nucleus group of scientists upon which an adequate aeromedical research program can be built. In this respect, legislation as proposed in H.R. 3779 and H.R. 4686, giving through amendment of the Federal Aviation Act of 1958 an undisputed role for the FAA's civil aviation medical and human factors research, will provide a major impetus to the FAA's actions in this area. It will eradicate, in my opinion, the present upper level ambivalence toward the aeromedical research in the FAA, and lead to much greater productivity in the

aeromedical area. The legislation if enacted will return dividends many times over through diminished numbers of aviation accidents (an estimated 80 percent are due to human factors errors) and diminished morbidity and mortality in those accidents that do occur.

As a final comment, when I joined the FAA in 1961, I reported organizationally to the Federal Air Surgeon's office in Washington (at that time its head was called the "Civil Air Surgeon"), and, the office head reported to the Administrator. In this way, the Administrator had direct, unfiltered, information from his top medical officer and advisor who is in charge of the only FAA program with which every airman requiring a medical certificate must return on a regular basis for continued FAA certification. Some years ago the FAA moved the Federal Air Surgeon position to a location under an Associate Administrator, effectively diminishing the two-way unrestricted flow of information to the Administrator. The resulting progressive decrease in resources and top level support for the Office of Aviation Medicine and the Civil Aeromedical Institute unfortunately are a direct result in my view of the above demotion and consequent loss of effectiveness of the Office. The Federal Air Surgeon must have a clear voice to the top in meeting the National needs in medical certification, research, airman education and safety counseling. To accomplish this, I recommend that the position

report once again directly to the Administrator, a relationship proven to be effective and necessary from 1959 to approximately 1980.

Thank you for this opportunity to testify on this vital subject of importance to civil aviation safety.

Stanley R Mohler MD

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Addendum: For an excellent detailed historical review of the FAA's medical program, see Civil Aviation Medicine in the Bureaucracy, by Heber A. Holbrook, Banner Publishing Co., Bethesda, Maryland, 1974, pp. 1-347.

Mr. McCURDY. Thank you, Dr. Mohler, and right on cue. As Tom said, a great witness. Well, it is the right idea. You said the right things. Most of all, I commend you because you cut through all the excess, and as good surgeons, you got right to the bone, I guess.

I share your concern about the atrophy at CAMI and why it was allowed to occur. We and I personally, and I know the gentleman from Florida shares this, demand excellence from the administration of the FAA, as we would any agency; but in reality, when I first went through the facility since I became chairman a couple of years ago, that was not an excellent facility. It was not even a good facility at that time because of the atrophy that had occurred.

We are trying to find out what the cause of that is and how you change it. Not just the symptoms, but what is the cause? One of the causes may be the fact that they didn't have access and thus lack of priority and therefore they didn't have the resources. It is hard to keep good people if you don't get the attention and respect for what you are doing in your search for excellence and striving to be excellent.

But there could also be the other side, that they didn't have a clear mission, and the lack of a clear mission allowed the muddling of the projected statements and the arguments for priorities. If you don't have a clear mission, it is hard to go out and argue for those dollars, and it is hard to argue for the right people. I saw a lack of that, to be honest.

The physical facilities, if they don't deteriorate and if they are not impinged upon by non-research types, are generally pretty good, but I saw a resource question there that was serious, and the fact they haven't been able to recruit and get the manager into that position.

All these things are disturbing, and I don't know which comes first. We are trying to approach it all at the same time and we are trying to get the support of the Administrator. I think there will be congressional support for CAMI, but we need to bring the administration along at the same time. It is not just one thing for us to come up here and say, "here is the legislative fiat, go out and make this place a great place." If you don't have the administration goal congruent, if they don't agree with that, then you are not going to get there.

So from your perspective, was it all of those factors? Was it one more than another? You tend to stress the lack of access. If the Federal Air Surgeon were equivalent to Chief Counsel or the Assistant Administrator for Civil Rights or Administrator for Public Affairs or Assistant Administrator for Government and Industry or even Associate Administrator for Aviation Safety, do you think that would be enough, or what else should be involved?

Dr. MOHLER. I think that would be a major step forward. The position should have preeminence within the FAA. It should not be submerged one or two levels below the associate administrator level. It should be a person who can go straight into the Administrator's office with no big amount of calling and getting permission to enter the front door. Throughout the Agency, the perception of the Federal Air Surgeon should be one that he is a top level official with clout.

In my view the problem is readily solved with the stroke of a pen by the Administrator.

Mr. McCURDY. Let me play devil's advocate for a minute. How would you respond to those who say, "look, we have resolved all these questions. We have computers that are taking the place of the man in the cockpit, and we are automating everything, and we just don't need a doctor who happens to fly on the sideline as the person up there." I mean haven't we just eliminated that position?

Back in the old days when it was "seat of the pants" and you are flying long hours and all that, maybe a doctor in the cockpit was necessary. Haven't we eliminated that position or that need?

Dr. MOHLER. We really haven't because the computers have assisted in removing certain kinds of workload, but there are other kinds of workloads, cognitive workloads, the more complex mental thought processes, the interpretations, the handling of the problems of computer failure.

We have made many changes in the human-cockpit interaction that allow additional people. For example, we have got thousands of pilots flying who have had medical and alcohol and other kinds of problems simply because we have a strong medical program that can identify the safe from the unsafe, the work requirements from the work problems. This necessity for aeromedical research will continue to the end of the time we have airplanes. Otherwise, you would have airplanes without the pilots in them, and then at that time the doctor can be dispensed with.

Mr. McCURDY. Part of my vision, and I think others share it, is in aviation that the next generation, whether with the National Aerospace Plane or when we are going incredible speeds and going into orbit and then coming in, if that is not going to put stress on the human body, I don't know what will, and there will probably be even a greater need in the future for this knowledge of the human body and how we perform under that kind of stress.

Dr. MOHLER. That is correct.

Mr. McCURDY. So you answered the question to my satisfaction.

Dr. Schafer, did you have any comment on that?

Dr. SCHAFFER. Ditto. In other words, I don't think, unfortunately, that medicine or a physician will ever go away regardless of how we advance scientifically in an automated fashion. I think you are going to have a requirement in the FAA, for example, if you are going to maintain cognizance of this type of function and of medical programs, that that is going to get even more significant as time goes on and you get these increased technical requirements develop.

Mr. McCURDY. Gentlemen, what has your experience been in recent times in consultation with CAMI? Has there been an open door? Have they sought advice and help from people in the academic community and from the corporate world? Do you feel that there is a significant change here? We have got Dr. Collins sitting in the back of the room here still. You might as well get your plug in here.

Are there ways to increase that interface and improve it? Is the problem there or is it elsewhere? We are, again, trying to identify the problems and correct them.

Dr. SCHAFER. I think Stan is probably better to answer than I, but let me just make one comment. If you are, in fact, going to have the manager of CAMI under the Federal Air Surgeon, that is not going to do an awful lot of good if you have that Federal Air Surgeon reporting directly to somebody who is interested in regulations and standards because that guy can't devote his time and can act as a block getting you across the way to other areas of endeavor within FAA.

I think you have to do that. I think what started out sounds very good, but it has to be carried one step further, and that has to be up at this level. You can commit all the people you want to the process, but if you bury them down to where they can't deal with those people at their own level, at a significant level, they can have all the commitment and they are not going to contribute an awful lot.

Mr. McCURDY. So the two of you would be unanimous in your recommendation that this subcommittee recommend to the Administrator that the Federal Air Surgeon be elevated in the organizational scheme of things at FAA. Is that correct?

Dr. MOHLER. Yes, correct.

Mr. McCURDY. The gentleman from Florida.

Mr. LEWIS. Thank you, Mr. Chairman.

I can't do anything but agree with you gentlemen in what you are saying with respect to the Surgeon General. I know from my experience in the private sector when we had a problem—and I'm a believer in task forces—when we had a compressor design problem, we took the best compressor designer, the best performance analysis engineer and the best computer programmer and we put them together to head up the task force to get the job done, and that is what they worked on. Those people were selected from various groups, but true, they reported to me or to the general manager straight in line. When that task force was done, they went back to their normal jobs.

I think that is exactly what you are alluding to, that when you have a job to do, you have got to have the muscle in order to do it.

Looking at the organizational structure and listening to the questions of the chairman, I think that he has hit solidly right on the head and you have answered the questions as to what has to be done if we are going to get this human factors situation straightened out because I'm not all together sure it is going to do anything more than just be in the maze of the bureaucracy and continue to stumble along. If it is important enough to get done, then the Administrator should have a key role in this where he is going to be receiving the information directly from the people involved so that he can get the job done. When it comes third or fourth or fifth hand to you, it certainly is a problem.

Dr. Mohler, I would like to ask you a question. You had made a statement on page 6 of your testimony about we are not now requiring the available upgraded interior materials for airline aircraft that are less toxic during on-board fires, that they are not currently used. Do you mean that we should have FAA mandate the use of these throughout the industry?

Dr. MOHLER. I think they should. I think they should do it and do it now, take advantage of what is known, the research data that is

available. It is going to cost a little more for the airlines, but I am sure that the passenger public will be willing to carry the small increase on the ticket for the increased safety.

Mr. LEWIS. I believe you are correct. I subscribe to that. I have talked to probably several thousand people over the past year about this problem, and I asked the question: If it costs you five dollars more for your airline ticket or ten dollars more for your airline ticket but it increased your survival ability rate 40, 50 or 60 percent in a survivable crash, will you be willing to pay it? They are willing to pay \$25 or \$50 more if you get it much better than it is today.

I have a concern, and the gentleman from Pennsylvania was asking questions about this earlier. You made the statement that with the medical systems we have today, you know what these medical problems of the air crews are and you can control them to a certain degree. Do you believe—and this is sort of a touchy question but you are sort of a direct individual, Dr. Mohler and you will probably answer it directly. Do you believe that we should have a mandatory drug testing program within the airline industry for those who are responsible for the safety of individuals?

Dr. MOHLER. Let me preface it by saying that there was a long period of time when we had no real drug problem. I think at the present time we still don't have a real drug problem. We have maybe a very scattered few drug abusers in the aviation industry, but the perception by the public is that there may be a problem there. I believe that a future time will come when we won't have a drug problem and the public will understand it.

So my conclusion now is that actually we don't need a drug testing program. We didn't need it before. We have a perceived problem now, and we won't have it at some point in the future. So my personal feeling is we don't need one. However, to assuage the fear of some segment of the public, a spot check program perhaps, if operated as Mr. McArtor stated, may be a political necessity. I do fear that the tests are not as 100 percent accurate as they should be, the way Dr. Carter had stated. I am concerned that 50 or so pilots a year will be discredited as drug abusers when they are not but are simply false positives. That does concern me.

To give a direct answer, I personally don't subscribe at this time to a drug testing program. I think drug education, an active FAA education program would pay much bigger dividends.

Mr. LEWIS. How about you, Dr. Schafer?

Dr. SCHAFFER. I think we should have one.

Mr. LEWIS. Pardon?

Dr. SCHAFFER. I think a program should exist, a mandatory program. I hate to differ with my great colleague Stan here. I feel so because I think to use the argument that there are false positive tests and you are going to hurt some individuals can be overcome by confirmatory testing and has been overcome by confirmatory testing in which you would never indicate that an individual is positive unless several batteries of tests have been gone through, which I think is now the recommended mode and which is used in the military services.

So I would suggest a mandatory program on a random basis. I see no reason why not. I tend to disagree that it is not a significant

or could not possibly be a significant problem. I would most certainly recommend it, but then I come from an area of work in which we have been making commands and demanding programs for a long time, and that was in my past military career, so perhaps you should use that advice with a grain of salt.

Mr. LEWIS. I understand. Thank you, both of you, for your comments on that. It is basically what I expected. I expected a difference.

We were talking earlier with Mr. McArtor and Dr. Collins and Dr. McMeekin on human factors. Both of you gentlemen have tremendous background and experience in this area. Do you feel that we are rapidly approaching—I would like comments from both of you on this—rapidly approaching an area where in the past the great salvation of a pilot was to start off and move his way through the various aircraft, get checked out and become a captain, and of course, the most glorious, or at least it used to be, was to become the captain of a 747, which was the biggest thing flying in commercial aviation at the time.

Do you feel that we are rapidly approaching the time when individuals are going to be restricted to the type of aircraft that are going to be able to fly? I will just use these as hypothetical reasons. That some people will be capable of flying a DC-9, some a 747, some a 757, some a 767, but some of those, the DC-9, will never be able to advance to a 747 because they have met their competence level abilities.

Now, I am talking about the complexity of the display systems, the cockpits that are computer operated, the hot wire, the whole thing, fly-by-wire types of operations that we are getting into.

What is your general feelings on that?

Dr. MOHLER. Mr. Lewis, I might comment that at the present time there are airlines that do keep a pilot at a particular level if that pilot is unable to transition. There are others who have an "up or out" policy. The pilots must meet the next level of aircraft or depart the airline.

Mr. LEWIS. I am aware of that.

Dr. MOHLER. So there are circumstances now where pilots may be retained, and it would be my view that each pilot should be assessed in regard to the abilities and capabilities of the pilot and allowed to operate at whatever the optimal level of that pilot is and not exceed it if he reaches a point of inadequacy with the new generation or another type of aircraft. I see nothing wrong with that approach, which tailors the individual to the aircraft. I think it is logical and is, as indicated, in operation today.

Dr. SCHAFER. I generally agree with that. It really is a training function into any new type of aircraft. If a person can't train into it, there is no reason for them to be eliminated. They go back to the other one, but there most certainly is a reason for them not going into the new aircraft or the new system.

I would say that it would be a training function. I don't see too many systems coming up in the near future that will strain the load that much at this point in time. We may get that way, but I think that may be an exaggeration of the fact.

Mr. LEWIS. I thank you for those answers. I'm a firm believer that the FAA should be the guru or the all sustaining force for

flight safety and aircraft safety. Do you believe that the FAA should establish levels of competency for various types of aircraft for the pilot to fly the right seat and the left seat? That they should establish and enforce the rule?

Dr. MOHLER. I think that the FAA should. It actually does to a certain extent, establish those criteria.

Mr. LEWIS. To a certain extent; that's correct.

Dr. MOHLER. I think they could extend it in cooperation with industry. They definitely could and this is another role where CAMI could play an important part in assisting and assessing individuals in regard to the different kinds of aircraft operations and aircraft.

Mr. LEWIS. I raise the question primarily because of an aircraft accident we had where we had the competence levels questioned of both the pilot and copilot. One had zero time in the aircraft and the other had nine hours in the aircraft and never took off or landed the aircraft. He was flying the left seat. Well, he took off and landed—don't misunderstand me. Neither one of them ever flew in the particular storm that they had the wreck in, and I was very much dismayed when I read and heard that the FAA was requesting that certain rules be followed by the airline industry, rather than telling them that—because we're talking about the loss of life.

Dr. MOHLER. Yes, You have touched on an important point that I have put in my submission for the record document. That is, there are two philosophies in the FAA. There are two groups of people. In my 17 years in the FAA, I encountered these. One group states that the FAA should keep a hands-off, more or less, approach to industry. Let the industry make the progress. Let the industry decide the training standards and the other standards. Let the industry decide how things are done. The FAA mainly follows the regulations that are in place, and makes certain that the industry more or less abides by the existing regulations. The second group in the FAA is technically oriented, and feels that the FAA should be the leader, as you have indicated, setting the policies, collecting data, establishing the safety criteria for flying.

These two groups are sort of in competition with one another. I'm afraid that our medical program has sort of slid under the group that the FAA is more or less a paper-shuffling, bureaucratic type of operation and leaves everything to the outside world. So, the FAA should be a leader in my view; should be a technical leader, and I certainly support that approach.

Mr. LEWIS. Dr. Schafer?

Dr. SCHAFER. I would support that, although not having the direct knowledge that I should have about the FAA, perhaps shouldn't comment, but I would go along with what Stan has said.

Mr. LEWIS. Thank you doctors. We appreciate your interest. Thank you, Mr. Chairman.

Mr. McCURDY. I thank the gentleman. Doctor, I think that was a fitting note to conclude on, because I share your view that there has been competing forces within the FAA. One saying let industry really take care of itself, and the deregulation and all of these things just kind of emerged, and we're not going to be the regulators.

I don't think that the FAA has to be an involved regulator. I think what they need to do is to lead by example and set standards and try to establish standards of excellence and safety in the country and in aviation. We don't do a very good job in this country of articulating what aviation means to the health and vitality of our country—from an economic standpoint and beyond.

When you look at the surplus in trade, it's aviation that leads. It is the only area where we have a surplus and we have deficits in every other area. It distresses me when I see our presidential candidates on both sides; neither one really articulating what the vision of the future of this country is. Technology plays a key role.

I think aviation is still one of the fundamental pillars of that. What has distressed me and, I think, the gentleman from Florida so much, is that unfortunately, CAMI fell into that role of shuffling paper and testing urine samples and not doing the kinds of research or not articulating their message or their mission and publicizing it somewhat. You have to be somewhat in the public relations business as well. I believe that now is the time to move out of that, and I think Dr. Collins and the new Manager is going to have a major challenge.

One, they have the support of the Administrator for the first time in some time, but they also have the support of the Congress. I think if they effectively articulate their message, and we assist them by trying to urge more access by the Federal Air Surgeon and the Manager of CAMI, that perhaps we have progressed in the area of increasing air safety, but more importantly, achieving some higher standards of excellence in research and development in this entire area of human factors which is so directly tied to the future of aviation in my opinion.

So much for the sermon. Your statement, I think, led into that, and I appreciate both of your commitments to this. With that word, we will stand adjourned, and if you have any follow-on comments that you care to make, please don't hesitate to forward those to the Subcommittee. Again, we thank you for your time and for your efforts today. Thank you.

[Whereupon, at 11:28 a.m., the Subcommittee was recessed, to be reconvened at the call of the Chair.]

APPENDIX

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October 13, 1988

Mr. Dave McCurdy
Chairman, Subcommittee on Transportation
Aviation and Materials
U.S. House of Representatives
Suite 2321 Rayburn House Office Building
Washington, D. C. 20515

Dear Mr. Chairman:

I received your letter of September 9, 1988, and your request for my comments regarding the role of aviation medicine in the FAA.

You are right. I had a role in establishing the CAMI and I enjoyed having the Federal Air Surgeon report directly to me as the FAA Administrator. I sought to foster and strengthen his role across all elements of the FAA from the employee clinic, to research in the aging of pilots, to psychological evaluation of key employees for promotion, to criteria for airmen qualification, to psychological thickets for intercepting terrorists, etc. etc. Crash survivorship was one of our more important projects as well as human factors in crew cooperation and therefore in the early days of the FAA the Federal Air Surgeon was a key player in the game of air safety.

As you know, I am deeply disturbed about what has happened to the Federal Air Surgeon under recent Secretaries of Transportation and the deep stratification of the bureaucracy that has resulted. It seems as though the Federal Air Surgeon is now so many layers down the DOT pyramid that he cannot make a maximum contribution to the mission of the FAA. Not only should the Federal Air Surgeon's role be strengthened with full participation in the Agency's policies and programs but his grade, compensation and recognition should be improved.

With regard to CAMI, I must disqualify myself by saying I have had no recent contact and experience with this unit. I am however convinced that one of the most important aspects of flight safety in the future will be research, understanding and wise policies regarding human factors in the system. Crew vigilance and the causes for lack thereof make headlines each month. Antique airmen qualifications must be reviewed. Drug abuse and alcohol must be dealt with wisely and fairly. The basis for nearly all safety programs must be careful research and consideration of human factors as the surge toward automation makes monitors out of aviators and controllers.

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Mr. Dave McCurdy

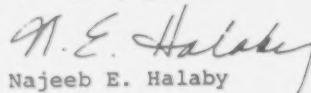
October 13, 1988

I therefore believe that we should have in the FAA that level and quality of scientific and medical programs that we have devoted to the Defense and Space Programs. We should stop treating it as an orphan child in an operationally oriented and heavily bureaucratized unit of the DOT.

The first step would be to upgrade the position of the Federal Air Surgeon with wider mission, larger budget and better incentives. This could be done at once. However, to return that position to its proper role in the Agency and the Agency's proper role in the U.S. Government would require an emancipation that can only come from reform such as that proposed in Senate 1600 and related Bills offered in the House.

I hope this is responsive to your request. I assure you that my critique is not intended to demean the efforts of anyone currently in the FAA rather it recognizes the constraints under which they have been recently forced to operate and suggests the kind of reform that the next Administration should produce as early as practicable.

Sincerely yours,



Najeeb E. Halaby

NEH:sf

bcc: C. R. Melugin
R. R. McMeekin

Don Flickinger, M.D.
Aerospace Medicine

(General Don Flickinger, USAF (Ret) was one of the primary authors of aerospace medicine practice as it developed during its formative World War II years through to the early space era. General Flickinger invented the Man In Space Soonest (MISS) program which became Mercury under NASA. He was Command Surgeon, Director of Life Sciences Research, and Assistant for Bioastronautics for the Air Force Systems Command (AFSC) during the emerging space era)

The questions of the hearings were put to General Flickinger and the substance of his response is summarized for the record:

"I think it should be understandable why people such as ourselves, who have spent the majority of their adult lives working in the flying business, should expect the United States to have one of the very best civil air organizations in the world. We don't necessarily claim to make the best autos or the best TV sets, but, after all, throughout our relatively short life, the old US of A has certainly pioneered in the flying business. It can hardly be doubted that we have built the finest aircraft, both military and civilian, and we have certainly produced the very finest pilots ever."

"The principal problem, for me at least, is how do you measure the relative efficiency of a nation's civil air system? Initially, we have considerable difficulty comparing the USA system to other nation's systems for the simple reason that most all of the others are heavily subsidized and, in a sense, controlled by the government. Furthermore, what criteria does one use to determine the efficiency of a given air operation? For instance, is it accident free miles flown per passenger or maximum 'on-time' record? I have no idea."

"There are three factors directly responsible for flight safety: the equipment, the weather, and the skill and judgement of the air crew. It would appear reasonable, then, to assume that the civil air organization should give equal importance to all three of these factors. Certainly the Federal Air Surgeon should sit at the highest level and have equal say and authority with the other chiefs. I don't believe that such is currently the case at FAA. The senior flight surgeon should report directly to the top boss and not through an intermediary."

"My adult life was spent entirely with the military air arm and, I must confess, that I enjoyed that career greatly. I served under and with some of the finest and most competent men imaginable and I never had the misfortune of serving with a commanding general who didn't give me full authority and responsibility for keeping his air crews fit and flying efficiently. I have never been directly concerned with the FAA, so I don't want to be caught 'baptizing out of my own parish.' However, I think that some general statements might be at least partially applicable:

Firstly, I think that the choice of the Federal Air Surgeon is very important. I don't believe that he should necessarily come from

the military; at the same time, I must confess that the choice of Frank Austin was excellent. Ideally, I would think that the FAS might come from the ranks of the airline flight surgeons. They know the business from the operational end and that is the most important thing for the FAS to know in all its gory details.

Secondly, the methodology is a relatively simple one and one which I used throughout my years overseas with tactical and strategic fighting forces. Each month the Boss man sits down with his operations and maintenance officers along with his flight surgeon and reviews the records of all of his aircrew members. There will be an average number of missions or sorties (or passenger miles flown) by the group. Those crew members falling significantly below this average need a reasonably valid cause for their under par showing, and it may be found on the occasion of this joint meeting. If not, then we have a problem which needs further prompt review and analysis.

If the crew member has been excessively burdened by bad weather, lousy equipment (poor maintenance), or poor health then those things should be corrected before he is required to go back on the line. Unfortunately, in many cases, this means that for the time being at least, the crew member will be taken off flying status and this again, in most cases, means a significant loss of income. And, therein lies the big problem which, under current airline procedures, has no satisfactory answer. Who can honestly expect a crew member to be honest with the dispatcher when he checks in with a colossal hangover or the first stages of the seasonal flu if he knows that it may cost him his next month's alimony or mortgage payment? No way buddy, no way.

I was able to work this out on several occasions during WW II, but it takes a very understanding Boss and several sub-bosses in order to do it without destroying the morale of the healthy crew members.

Where and how would the airlines use these crew members if they were taken off flying status for a week or ten days? Move them to administrative jobs? Hardly this, when each airline is struggling to stay afloat financially.

Still, I think that if I was the Federal Air Surgeon, I would seriously try to push this responsibility (for maintaining a healthy, well-motivated nucleus of air crew members) back on the laps of the airlines themselves.

Another thing, I would very definitely do, would be to have several pretty sharp assistants who would spend most of their time flying the various air routes in the country and keeping their eyes and ears in a very open and receptive state."

